4 Indigo Buntings	*Spiza cyanea*	Purchased.
2 Balæniceps	*Balæniceps rex*	
1 Stump-tailed Lizard	*Trachydosaurus rugosus*	
1 Common Agouti	*Dasyprocta* —— ?	
1 Coati-Mondi	*Nasua fusca*	
4 American Doves	*Chamæpelia passerina*	
2 Red-winged Starlings	*Agelæus phœniceus*	
2 Nonpareils	*Spiza ciris*	
1 Common Gnu	*Catoblepas gnu*	
1 Young Lioness	*Felis leo*	
1 Wryneck	*Yunx torquilla*	
1 Wanderoo Monkey	*Silenus veter*	
1 Lory	*Lorius garrulus*	
2 Lesser Weaver Birds	*Hyphantornis*	
3 Virginian Nightingales	*Cardinalis virginiana*	
3 Turquoisine Parrakeets	*Psephotus pulchellus*	
1 Wheatear	*Saxicola œnanthe*	
1 Nuthatch	*Sitta cæsia*	

Of these, *Balæniceps rex* was stated to be exhibited for the first time.

May 8, 1860.

E. W. H. Holdsworth, Esq., F.L.S., in the Chair.

The following papers were read :—

1. On an apparently New Species of Paradise-Bird. By William Goodwin.

I beg permission to introduce to your notice a Bird of Paradise, which I believe to be either altogether unknown, or at least hitherto undescribed.

I have interested myself for many years in this branch of Ornithology, and possess in my own collection twenty-nine specimens, representing all the different species known up to the present time, with the exception of *Semioptera wallacii*. I have had opportunities of inspecting the fine collections of these birds sent to England by that energetic and able naturalist Mr. Wallace, and have searched in vain for any specimen similar to that which I have now the honour of introducing to the meeting. I therefore conclude it to be in all probability an entirely new and undescribed species.

The bird now before you, which I believe to be the female, came into my possession about twenty years ago, together with another, which I have no doubt is the male bird. This latter specimen is now in the British Museum.

I received them both from Mr. Bartlett, and we then agreed in considering them as a young male and female of the *Paradisea papuana*; but the numerous specimens which I have examined in the collections of Mr. Wallace, consisting of males, females, and young of the latter bird, have now convinced me that they belong to an entirely distinct species.

The male (now in the British Museum) is smaller than the *Paradisea papuana*, the length from head to end of tail being about 9 inches, bill $1\frac{1}{4}$ inch, wings from shoulder to tips barely $7\frac{1}{2}$ inches, tail $5\frac{1}{2}$ inches. Feathers on the head and shoulders yellow; back, tail, and wings dark chestnut-brown; the coverts of the wings edged with yellow; the two central tail-feathers have naked shafts 15 inches in length, terminating with elongated webs 3 inches long; the throat has a small patch of golden green, which surrounds the base of the bill; the lower parts, with the exception of a small patch of brown under the throat, white; side feathers somewhat elongated and soft.

Female: length from head to end of tail about 9 inches, bill $1\frac{1}{4}$ inch. Forehead, throat, sides and top of the head dark chocolate-brown, shading to a dingy yellow and cinnamon colour; tail-coverts tinged with yellowish-brown; tail cinnamon-brown, $4\frac{5}{8}$ inches long, the two middle feathers narrow, pointed and curved, $4\frac{1}{2}$ inches in length; the whole of the under parts from the throat white; side feathers soft; *legs and wings imperfect*.

Mr. Bartlett informed me that these birds came to England with other skins of Birds of Paradise, viz. the Clouded (*P. magnifica*), Golden-breasted (*P. aurea*), and the *Ptilorhis magnifica*.

The locality was unknown to him, and is probably one which Mr. Wallace has not yet visited. Should he continue his researches, he may yet be fortunate enough to meet with this species.

In conclusion, I beg to propose that the bird now brought under your notice be named *Paradisea bartlettii*, in recognition of the valuable services rendered by Mr. Bartlett to the lovers of ornithological science by his very careful researches and numerous observations.

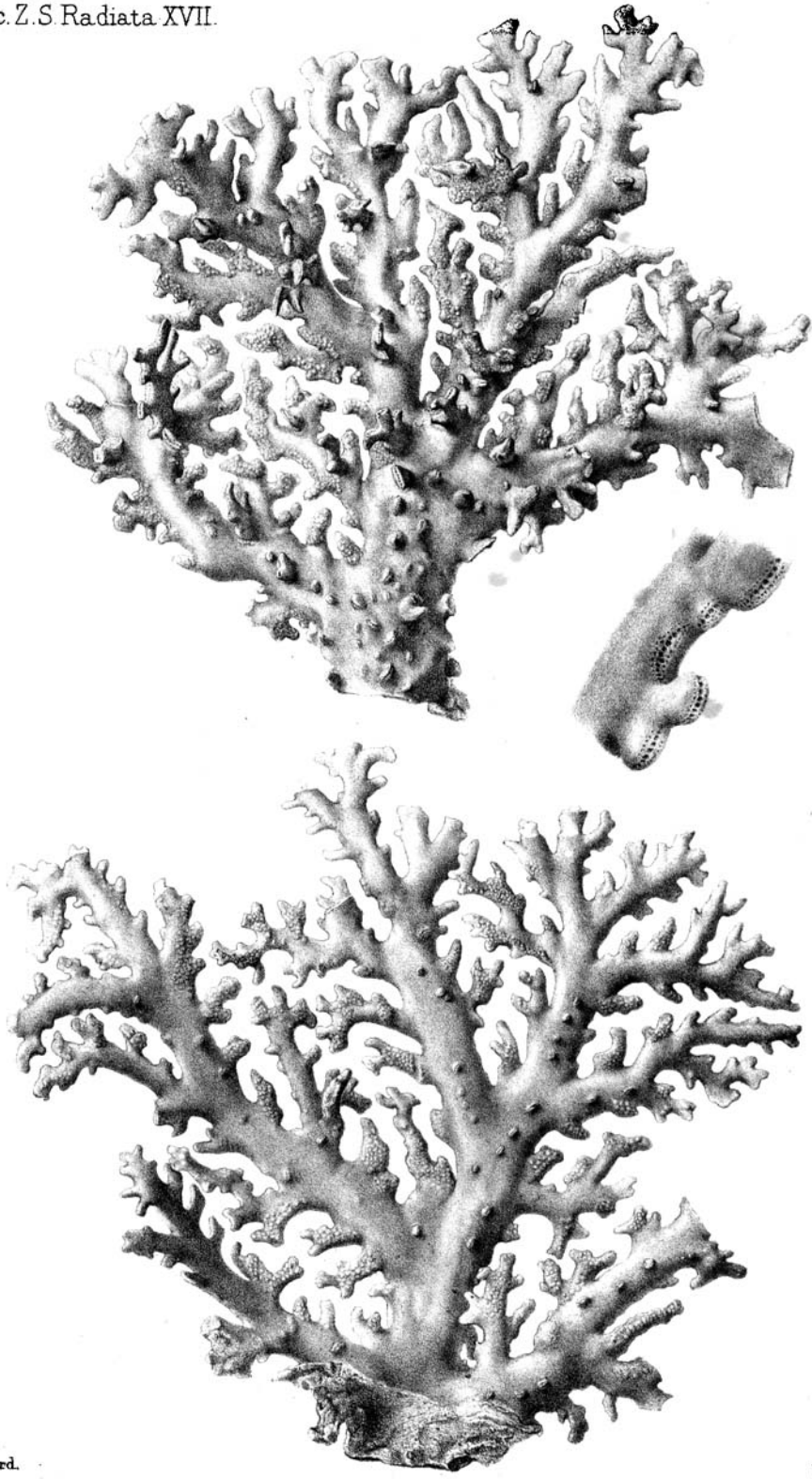
2. Description of a New Species of Distichopora from New Caledonia. By Dr. J. E. Gray, F.R.S., V.P.Z.S.

(Radiata, Pl. XVII.)

The British Museum has lately received several very fine specimens of a beautiful palmated Coral, belonging to the genus *Distichopora*, from the sea near New Caledonia.

Distichopora coccinea, sp. nov.

Coral bright crimson, much branched, compressed; branches rather fan-shaped, expanded, placed on each side of the stem; the sides of the branches rather compressed; the main branches with a



G.H. Ford.

W. West imp.

Distichopora coccinea: *Gray.*

subcentral series of small compressed tubercles, like the commencement of new branches; lateral pores narrow, cells small.

Var. The upper surface of the stem with many short furcate branches.

Hab. Pacific Ocean, near New Caledonia, in deep water.

This species differs from the only other recent species of the genus known, viz. *D. violacea*, not only in the beautiful bright crimson colour, but also in the form of the stem and branches, which in this coral is much more compressed, broader, and with shelving edges, giving it a rather sword-like appearance. The lateral grooves containing the cells are much narrower, and the polypiferous cells much smaller. In one specimen the small oblong compressed tubercles on the middle of the upper side of the branches are produced into simple, forked, or sometimes more subdivided short branches. The apices of the branches, which have been broken and reproduced, are whitish.

The surface of many of the branchlets, as in *D. violacea*, is more or less covered with more or less crowded, convex, circular elevations or slight tubercles, which appear to be hollow and blister-like, with rather thick parietes.

3. List of Mammalia collected by Mr. J. Monteiro in Angola. By Philip Lutley Sclater, M.A., Secretary to the Society.

As so little is known of the Mammals of Angola, I have thought that it might be worth while to record the names of a few species observed or collected there by Mr. J. Monteiro during his recent residence at Bembe. Most of the specimens are flat (furriers') skins from the interior. They were obtained from the caravans that brought down ivory, and belong to animals which are natives of a district lying about 300 miles from the coast.

1. Colobus angolensis, sp. nov.

Ater: humerorum utrinque pilis elongatis et caudæ apice albis.

Long. tota 24·0, caudæ 24·0 poll.

This *Colobus* is readily distinguishable from other West-African species by its *black* tail having only a white termination. *Colobus guereza* of Eastern Africa has a somewhat similar tail; but the white extends all along the body, over the face, &c. The single skin sent is very imperfect, wanting the feet and face, but still affords sufficient indication of the distinctness of the species.

Wagner, in his 'Supplement to Schreber's Säugethiere' (vol. v. p. 36), Pel in the 'Bijdragen tot de Dierkunde' of Amsterdam (vol. i. p. 7), and other writers have, I think, rather hastily reduced the species of Black and White *Colobi*; of which there appear to be at least five, recognizable as follows:—

(1.) Colobus ursinus.

Colobus ursinus, Ogilby, P. Z. S. 1835, p. 98; Fraser, Zool. Typ. pl. 1.

Ater : facie, mystacibus, et cauda tota albis.
Hab. In Afr. occident., Sierra Leone.

Mr. Ogilby's type-specimen of this species is now in the British Museum. It is probably the same as *Colobus polycomos* (founded on Pennant's Full-bottom Monkey), but it appears decidedly distinct from the next following.

(2.) COLOBUS VELLEROSUS.

Semnopithecus vellerosus, Is. Geoffr. St.-Hil. Voy. de Bélanger, Zool. (1830).
Semnopithecus bicolor, Wesmael, Bull. Acad. Brux. ii. p. 237.
Colobus leucomeros, Ogilby, P. Z. S. 1837, p. 69.
Colobus vellerosus, Is. Geoffr. St.-Hil. Cat. des Mamm. p. 17.
Ater : fascia frontali, facie, barba, mystacibus, natibus et cauda longissima albis.
Hab. In Afr. occident., Gold-coast.
Mus. Brit.

Easily distinguishable from the former species by the distinct white frontal band, and the white thighs and buttocks. Two fine and perfect examples are in the Gallery of the British Museum.

(3.) COLOBUS ANGOLENSIS.

Ater : humerorum utrinque pilis elongatis et caudæ apice albis.
Hab. In Angola.

(4.) COLOBUS GUEREZA.

Colobus guereza, Rüpp. Neue Wirbelth. p. 1. pl. 1.
Ater : fascia circa faciem, gutture, prymnæ laterumque pilis longissimis, caudaque apicem versus albis.
Hab. In Afr. orient., Abyssinia.
Mus. Brit.

(5.) COLOBUS SATANAS.

Totus ater.
Hab. In ins. Fernando Po.
Mus. Brit.

2. CERCOPITHECUS MELANOGENYS, Gray, P. Z. S. 1849, p. 7. pl. 9. f. 1.

A flat skin of this species, which, as Mr. Monteiro informs us, is very abundant at Encôge, two days' journey to the south of Bembe (see Mr. Monteiro's note, *antea*, p. 112).

3. FELIS NEGLECTA, Gray, Ann. N. H. i. p. 27.

A flat skin, agreeing with Dr. Gray's type-specimen, which is also a flat skin, in the British Museum.

4. FELIS SERVALINA, Ogilby, P. Z. S. 1839, p. 94.

A flat skin, agreeing with Mr. Ogilby's type-specimen, which is also a flat skin, now in the British Museum.

5. NANDINIA BINOTATA (Reinw.).

A flat skin.

6. GENETTA ABYSSINICA, Rüpp. Neue Wirbelth. p. 35. pl. 11.

An example of this species was obtained alive and brought to England by Mr. Monteiro.

7. GENETTA —— ?

Flat skins of a second species, apparently a true *Genetta*, for which I am unable to find a name.

8. MUS RATTUS, Linn.

The Common Black Rat of Europe is, as Mr. Monteiro informs me, very abundant in the coast region of Angola.

9. MANIS TRICUSPIS, Sund.

Manis multi-scutata, Gray; Fraser, Zool. Typ. pl. 28.

Mr. Monteiro has furnished me with the following note on this *Manis*:—

"Abundant around Bembe (130 miles inland, West Coast of Africa, lat. 7′ 22″ S.). Said by the natives, to whom it is well known there as well as on the coast, to cause considerable damage to the plantations, by grubbing up the Mandioca roots, ground-nuts, &c., very likely when in search of the ants and larvæ said to constitute its food. The roots would very easily be exposed by this animal in the search for its food, as they are planted in hillocks of loose earth thrown up on the surface of the ground.

"The animal from which this skin was obtained was kept alive in a tub, and fed on ants and larvæ, for a fortnight, when it died, and the skin was sent to me.

"Its death was very probably due to its having been injured by the negroes that captured it,—these having great fear of all animals and reptiles, and their first impulse being to give everything alive they may see a crack on the head with a stick.

"I have often seen the skins in the negro huts, as also in Loanda on the coast, the scales being esteemed by the natives as a 'fetish' or charm."

4. NOTES ON TWO STRUTHIOUS BIRDS NOW LIVING IN THE SOCIETY'S GARDENS. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

At the last meeting of this Society I announced that we were expecting to receive two additional examples of Struthious birds for the Menagerie, which I had reason to believe would prove to be distinct from any of the seven then existing in it. I now have the pleasure of informing the meeting that these birds have arrived in

good health and condition, and that an accurate examination of them has convinced me, as well, I believe, as every one who has paid them a visit, that they really belong to independent species. We are now therefore the fortunate possessors of no less than nine different species of this important group, of which, until lately, but four were known to exist in the whole world in a recent state.

The newly arrived birds I allude to are examples of the Emeu of Western Australia (*Dromæus irroratus*, Bartlett), and the Cassowary with the throat-wattles divided and far apart, which I have proposed to designate *Casuarius bicarunculatus*.

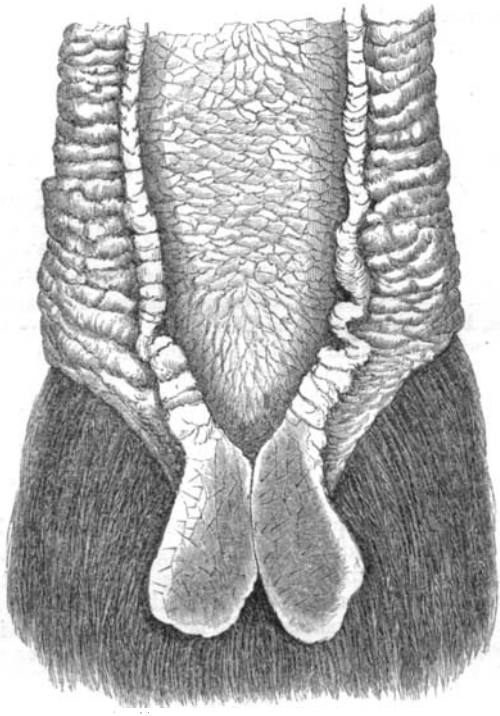


Fig. *a*.

The Emeu of Western Australia may, as was pointed out by Mr. Bartlett, when he first described it at a meeting of this Society in May 1859*, be easily distinguished from the well-known Eastern bird by its spotted plumage. On comparing the feathers of the two species together, the mode in which this spotting is produced is clearly apparent. The feathers of *D. irroratus* are barred alternately with silky white and darkish grey throughout their length, terminating in a black tip margined posteriorly with rufous. Those of *D. novæ*

* See P.Z.S. 1859, p. 205.

hollandiæ are uniform blackish-grey from the base to the extremity, which is black with a broad subterminal band of rufous. On comparing the two living birds together, we find *D. irroratus* generally of a much more slender habit. The tarsi are longer and thinner, and the toes longer and much more slender. The tarsal scutes are smaller. The irides are of a pale hazel, instead of a reddish brown as in *D. novæ hollandiæ*.

The example of *D. irroratus* in the Gardens of the Zoological Society of Amsterdam was brought by a Dutch vessel from Albany, King George's Sound. I have reason to believe that our specimen

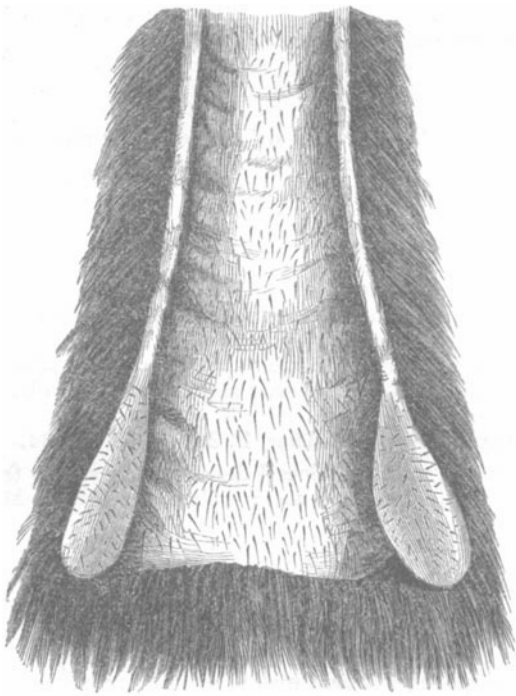


Fig. *b*.

is from the same locality. As Mr. Bartlett's original skin of *D. irroratus* was obtained in the interior of Southern Australia, the range of this Emeu must be supposed to extend over the western portion of Australia into the latter colony, where it probably inosculates with *D. novæ hollandiæ* *.

With regard to the *Casuarius bicarunculatus*, I am unable at pre-

* Two additional specimens of the Spotted Emeu (both immature) have since been received by the Society from Swan River. In this stage of plumage the bird is decidedly darker than its near ally, *D. novæ hollandiæ*.

sent to give any particulars concerning its true *habitat*, though in all probability it is the representative of the Common Cassowary of Ceram (*Casuarius galeatus*) in one of the Molucca group or adjoining islands. The specimen which we possess is still quite young. The casque is not developed. Except as regards the complete separation of the two neck-wattles, as indicated in the drawings now exhibited (woodcuts *a* and *b*, p. 248–9), where fig. *a* represents the front view of the fore-neck of the Common Cassowary, and fig. *b* the corresponding part of the new species, this bird might well pass as a rather bright-coloured variety of the *Casuarius galeatus*. But I have little doubt that the bird, as it grows older, will develope further differences, and that, when adult, it will be readily distinguishable by other characters from the common species.

5. Notes on a Collection of Birds from the Vicinity of Orizaba and neighbouring parts of Southern Mexico. By Philip Lutley Sclater, M.A., Secretary to the Society.

(Aves, Pl. CLXIII.)

M. Aug. Sallé has kindly submitted to my examination a series of birds collected by one of his correspondents principally in the vicinity of Orizaba and the neighbouring parts of the State of Vera Cruz, concerning which I beg leave to offer the following remarks to the Society, in continuation of my former papers on Mexican Ornithology.

1. Turdus pinicola, Sclater, P. Z. S. 1859, p. 334.

One example; a male. Since I described this species from M. de Oca's specimens, I have seen an example in the Bremen Museum.

2. Mimus ——?

A single skin of a true Mocking-bird seems to indicate the existence of a second species nearly allied to *M. polyglottus* in Vera Cruz. The size is smaller, the colouring above rather paler, and the external rectrix has the outer web black towards the extremity. Before establishing the species, I should wish to see further specimens.

3. Regulus satrapa, Licht.

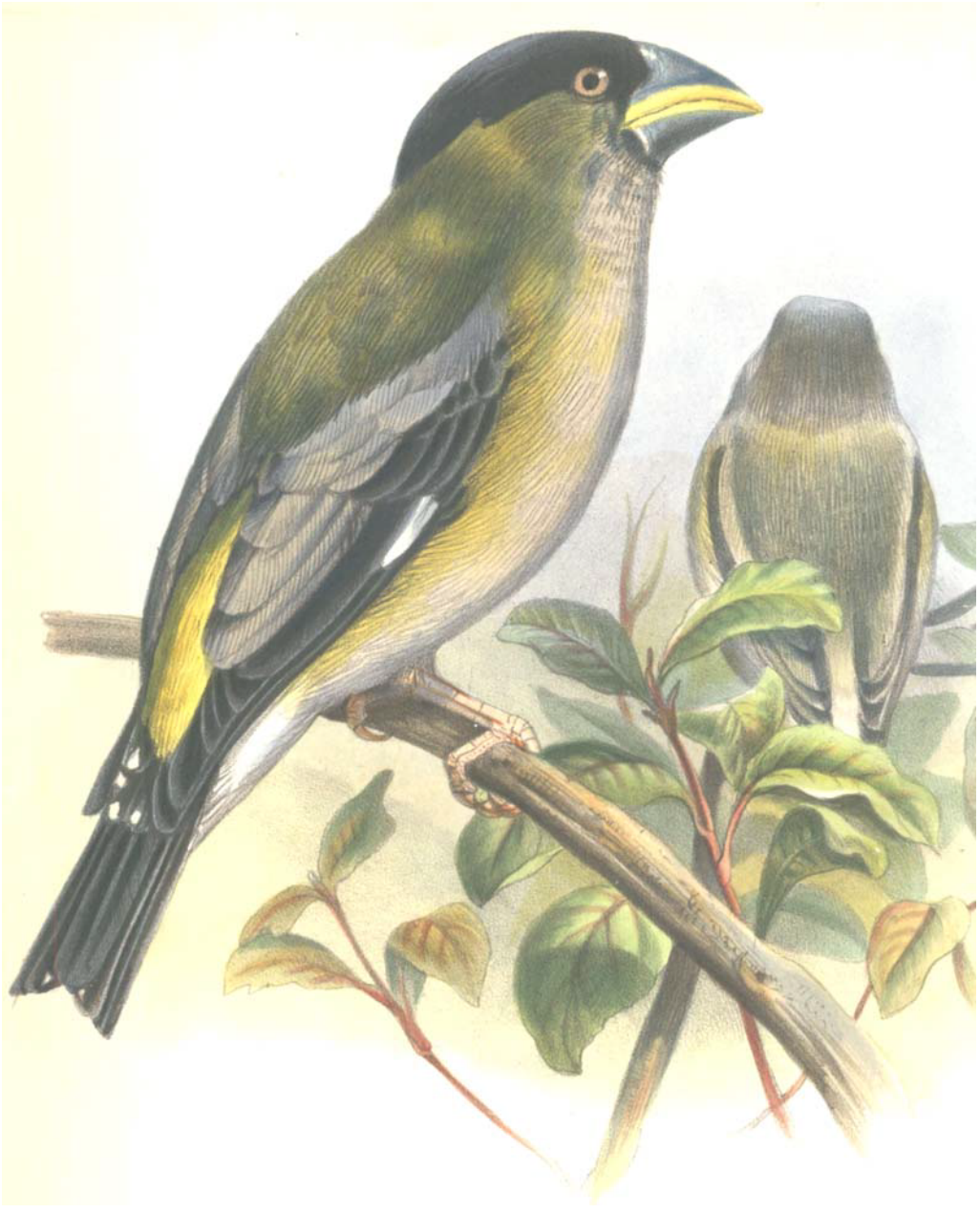
In full plumage.

4. Dendrœca auduboni (Townsh.).

In complete plumage.

5. Basileuterus delattrii, Bp. Compt. Rend. xxxviii. p. 383; Notes Orn. p. 63.

Nearly allied to *B. rufifrons* (Sw.), which is common in Mexican



COCCOTHRAUSTES MACULIPENNIS

W. Harring lith.

W. West imp.

collections, but easily distinguishable by the brighter yellow of the under-parts being prolonged over the belly, and the back being olive-green and not brown. The beak of the present bird is also stouter and the tail longer; but the form otherwise agrees with that of *B. rufifrons*.

The New-Granadian bird which I referred to *B. delattrii* in my list of Bogotan birds is clearly a distinct species again, distinguishable by its longer wings and the fuller yellow of the body beneath, which passes into olive on the sides. I now call this *Basileuterus mesochrysus*.

M. Sallé's specimen of *B. delattrii* is labelled 'Uvero: iris brown,' and is the only example I have yet seen of this bird.

6. VIREO FLAVIFRONS (Vieill.).

In fine plumage. Goes as far south as Guatemala. See 'Ibis,' 1859, p. 12.

7. PLECTROPHANES MELANOMUS, Baird, Rep. p. 436.

Two specimens, which, with another Mexican bird in my possession from M. de Saussure's collection, seem to agree with Prof. Baird's characters of *P. melanomus*. This is the extreme southern point that has yet been recorded for a species of this genus.

8. COCCOTHRAUSTES MACULIPENNIS, sp. nov. (Pl. CLXIII. fig. 1, ♂; fig. 2, ♀.)

♂. *Flavicanti-olivaceus; pileo alis et cauda nigris, speculo alari et rectricum lateralium macula terminali in pogonio interno albis; secundariis dorso proximis grisescenti-albis: subtus pallide ochraceus, flavicante indutus, crisso albo.*

♀. *Brunnescenti-grisea, pileo brunneo, caudæ tectricibus superioribus albo maculatis: subtus non flavescens.*

Long. tota 6·5, alæ 4·0, caudæ 2·6.

Hab. In Mexico merid. orient.

Mus. P. L. S. et Brit.

This beautiful Grosbeak forms the third American species of the group. It is easily distinguishable from *C. vespertinus* and *C. abeillii* by its black cap, white wing-bar, and the white markings on the outer tail-feathers. The general structure is that of *C. vespertinus*; the three first remiges are nearly of equal length. The bird described by Prince Bonaparte (Consp. i. p. 505) as the young of *C. vespertinus* was doubtless of this species, and there is a specimen of it in immature plumage in the British Museum.

9. COCCOTHRAUSTES VESPERTINUS (Cooper): Baird, Rep. p. 409.

I did not expect to find this Western bird ranging so far southwards.

10. ICTERUS PARISORUM, Bp.

Three examples, all in immature plumage.

11. Icterus abeillii, Less. Rev. Zool. 1839, p. 101.

An excellent species, allied to *Icterus bullockii*, but quite distinct.

12. Molothrus pecoris (Gm.).

An undoubted specimen of this species.

13. Cyanocitta diademata, Bp. Consp. p. 377.

Two examples agreeing with Bonaparte's description.

14. Corvus carnivorus, Bartram: Baird, Rep. p. 558.

A true Raven, very much resembling the European bird, which must be referred to *C. carnivorus* as distinguished by Prof. Baird, if that species is really distinct from *C. corax*.

15. Picolaptes lineaticeps, Lafr. Rev. Zool. 1850, p. 277.

I have a second specimen of this bird in my own possession, also from a collection made near Orizaba. M. de Lafresnaye was not acquainted with the true locality of this species, which makes a third Mexican bird of the genus, the others being *P. affinis* and *P. leucogaster*.

16. Thamnophilus melanocrissus.

Thamnophilus melanurus, mihi, P. Z. S. 1857, p. 203.

A female. This *Thamnophilus*, as I have lately ascertained from examination of Mr. Salvin's Guatemalan specimens, differs from the true *T. melanurus* of New Granada in having the crissum black, and I therefore propose to call it *T. melanocrissus*.

17. Cotinga amabilis, Gould, P. Z. S. 1856, p. 64. pl. 123.

One female example, which shows that this *Cotinga* ranges further northwards than has hitherto been supposed.

18. Ceryle alcyon (L.).

Several examples.

19. Momotus mexicanus, Sw.

Two specimens of this species transmitted are of smaller size than the third, but do not appear otherwise different.

20. Coccyzus americanus (Linn.).

21. Coccyzus erythrophthalmus (Wils.).

The collection contains undoubted examples of both of these northern species.

22. Centurus flaviventris, Sw.

A female of this species, as described by Baird (Report, p. 110).

23. Chrysotis guatemalæ, Sclater, Ibis, 1860, p. 44.

A perfect example of this Parrot, as described *l. c.*

24. Spizaëtus tyrannus (Max.).

Good adult specimens of both sexes of this species—the first I have seen from so far north.

25. Buteogallus nigricollis (Lath.).

Already noticed as far north as Guatemala (Ibis, 1859, p. 216).

26. Buteo albonotatus, Kaup, Isis, 1847, p. 399.

Three examples of this bird in various states of plumage.

27. Bubo virginianus (Gm.).

28. Crax globicera, Linn.

The Mexican and Central American Curassow appears to be the *Crax globicera*, and not, as I have hitherto considered it, *Crax alector*. In the latter bird the sexes are nearly alike. In the *Crax globicera*, as may be seen from M. Sallé's specimens and from living examples now in the Zoological Society's Gardens, the female is brown.

29. Tinamus robustus, sp. nov.

Tinamus major, Moore, P.Z.S. 1859, p. 63; Sclater & Salvin, Ibis, 1859, p. 226.

M. Sallé's present series contains two excellent examples of this large Tinamou of Mexico and Central America. As I had anticipated (P. Z. S. 1859, p. 63), it presents differences from *T. major* of Brazil, such as render a new specific name necessary, and I propose shortly to describe it under the above title.

30. Herodias egretta (Gm.).

Already noticed in Guatemala.

31. Demiegretta ludoviciana (Wils.): Baird, Rep. p. 663.

One immature specimen.

32. Florida cærulea (Linn.).

33. Tigrisoma tigrinum (Gm.).

34. Nycticorax violaceus (Gm.).

35. Tantalus loculator, Linn.

36. Tringa wilsoni, Nuttall.

37. Symphemia semipalmata (Gm.): Baird, Rep. p. 729.

38. Actiturus bartramius (Wils.).

39. Gambetta melanoleuca (Gm.).

40. Tringoïdes macularius (Linn.).

41. Rhyacophilus solitarius (Wils.).

42. Erismatura dominica (Linn.).

43. Querquedula carolinensis (Gm.).

44. Querquedula discors (Linn.).

6. On the Structure, Relative Size, and Use of the Tail-Glands in Birds. By Edwards Crisp, M.D., F.Z.S., etc.

It is strange that all (as far as I know) who have written upon these glands speak of one gland only; but, as I shall show hereafter, there are two distinct glands, from each of which proceeds a duct or canal for the conveyance of the matter secreted; and it would not be more incorrect to speak of the lungs or of the kidneys of a bird in the singular number than to describe the oil-glands as one gland.

As the heading of my paper states, my first endeavour will be to describe the structure of these glands, and then I shall pass on to consider their use.

The only English writers that I am acquainted with who have written generally upon the anatomy of birds are Professor Owen (article "Aves" in the 'Cyclopædia of Anatomy and Physiology') and Mr. Macgillivray in his 'History of British Birds, their Organization, Habits, &c.'

The first-named writer speaks of these glands, or rather of *the* gland, as follows:—

"The unctuous fluid with which birds lubricate their feathers is secreted by a gland, which is situated above the coccyx or uropygium. This gland consists of two lateral moieties conjoined; as might be expected, it is largest in the birds which frequent the water. In the Swan it is $1\frac{1}{2}$ inch in length, and has a central cavity which serves as a receptacle for the accumulated secretion; but this cavity has not been observed in other species. Each lateral portion is of a pyriform shape, and they are conjoined at the apices, which are directed backwards, and are perforated by numerous orifices. The longitudinal central cavities also present internally numerous angular openings in which there are still smaller orifices. The surrounding glandular substance consists of close-set, almost parallel, straight tubes, and is not irregularly cellular. The tubercles extend to the superficies of the gland without ramifying or intercommunicating, and preserve an equable diameter to their blind extremities. The tubercles are longest at the thickest part of the gland, and become shorter and shorter towards the apex."

It will be seen presently that my description of these glands differs materially from that given by Professor Owen.

Mr. Macgillivray, in the work alluded to (vol. i. p. 44), says,—"These feathers have their basis supported by the last coccygeal

bone, and firmly bound together by a strong ligamentous band composed of interlaced fibres. On its upper surface rests the uropygial gland, celebrated by the field- and closet-naturalists, being one of the few points of the structure of a bird accessible to them, and containing a quantity of oily matter mixed with an aqueous fluid, while on its lower surface is a layer of cellular tissue containing a similar substance. Both are apparently destined for nourishing the feathers, or at least are connected with their growth. I have observed that at the period of moulting, and especially when the tail-quills are growing, they are very highly developed, and, as is well known, sometimes inflame and suppurate in domestic birds; whereas in birds in which the moult has been completed, I have generally found them greatly diminished, and frequently entirely shrunk. This fact, analogous to that of the periodical enlargement of the testicles in birds, affords a key to the knowledge of the nature and use of the uropygial gland which has hitherto eluded the sagacity of physiologists; for the application of the oil contained in it by the bill is certainly fanciful."

I must express my surprise that such an accurate observer as the late Mr. Macgillivray should have confounded these glands with the cushion of fat in which the ends of the tail-feathers are imbedded: there is no resemblance in the structure of these bodies, and the use of the microscope would have decided the point at once.

I have not observed that the tail-glands are larger at the time of moulting, although it is not unlikely, in consequence of a greater quantity of blood being distributed to the roots of the tail-feathers, that there may be a slight increase of bulk at this period, more especially on the fatty portion of the tail.

Montagu, Fleming, Bewick, Jenyns, Yarrell, and other writers on British Birds, I believe, do not mention these glands. I have not had time to consult foreign authors, but I assume that if any of these had described two glands, the circumstance would have been mentioned by some English writers.

It may be well to speak of the caudal appendage, or rather of its motor apparatus, before I proceed to the anatomical description of these organs. The tail of most birds, as is well known, is very moveable, and consequently requires powerful muscles to effect this mobility. In the Peacock, and other gallinaceous birds with large tails, the rump-muscles are much developed, whilst in birds with small tails they are generally much diminished in size. The tail of a bird can be depressed, elevated, moved in a lateral direction, or the feathers can be spread out or contracted at the will of the animal. I need not describe *minutely* the origin and insertion of these muscles; it will be sufficient to indicate their general bearing. The elevator muscle (*levator coccygis*)—a strong, powerful muscle in many birds—arises from the sacrum, from the bodies and sides of the coccygeal vertebræ, and is inserted into the spinous processes of these vertebræ, and into the base and spinous process of the last vertebra. These muscles not only raise the tail, but when one acts, it moves it laterally.

The antagonist to this muscle is the depressor of the tail (*depressor*

coccygis), arising chiefly from the inferior and posterior part of the pelvis, from the bodies of the coccygeal vertebræ, and inserted into their inferior spinous processes, and into the base of the last vertebra. The action of this muscle, single and double, is the reverse of the last-named. The *quadratus coccygis* arises from the lateral portions of the coccygeal vertebræ, and passes in a somewhat curved direction over the fatty prominence of the base of the tail, and is inserted into the fascia below the tail, and into that enveloping the base of the tail-quills; it serves to spread and partly to raise the tail-quills.

The *ischio-coccygeus* arises from the ischium and lateral parts of the anterior coccygeal vertebra, and is inserted into the last vertebra and into the tail-fascia. It lowers the tail and moves it laterally.

The *pubi-coccygeus*, on the under surface of the tail, arises from the posterior parts of the pubis and ischium, and is inserted into the fascia of the quills. It acts by spreading the quills and by moving the tail laterally.

I have followed nearly the description of these muscles as given by Mr. Macgillivray, Professor Owen, and others. I could make many variations in the account when speaking of them in different birds, but this digression would be foreign to the object of my paper. I must, however, allude to two omissions made by these authors, which are important, I think, in relation to the function of the organs.

In many birds a portion of the elevators of the tail is inserted into the base of the glands, so that when these muscles contract, they favour the escape of the secretion. But in other birds, the Moor Hen for example, a distinct pair of muscles is spread upon the posterior and inner portions of the glands, which they serve to compress, and thus assist in the ejection of their contents; they also help to elevate the tail.

I refrain from naming these muscles at present, as a long series of dissections will be required before the matter can be properly determined, and the variations of these muscles accurately described.

The above account may by some be thought unnecessarily prolix; but I believe these muscles have an important bearing upon the use of the glands in question, serving by their action greatly to facilitate the passage of the oleaginous secretion.

Form of the tail-glands.—These glands are of a rounded, oblong, flask-like shape, and would be well represented by the junction of two Florence flasks at their necks, their bases being somewhat widely separated. In all the figures now exhibited of the six orders of birds, as will be seen, there is a general resemblance in their form. In some of the smaller passerine birds, however, they are more rounded than in the larger species.

Situation.—In the great majority of birds which I have dissected, these glands have been found upon the *levatores coccygis*, having the *quadrato-coccygei* and *pubi-coccygei* on the outer side, the posterior part of the spine of the last caudal vertebra, and the same part of the two or three anterior to this, between them. In some birds, in the

Palmipedes especially, where they are of larger size, they extend more forwards; and in many of the Accipitrine birds they are placed more upon the fatty prominence which supports the quill-feathers. In the *Scolopacidæ* and *Columbidæ* they are seated between the two central tail-feathers.

Structure.—Externally the gland is covered with a fibrous capsule, which is extremely vascular. I have failed at present to inject the interior of the glandular structure, nor have I succeeded in tracing nerves into it. In many birds, however, when examined soon after death, the blood-vessels may be seen running in parallel lines with the tubules, and ramifying upon them. The glands are generally thinly covered with short supple feathers of a downy character, and their flask-like necks are usually surmounted by a tuft of short soft feathers, varying greatly in number in the different orders, but more abundant in the swimming birds. In the *Pelicanidæ* these tufts are very large, and will hold a great quantity of oil. In other birds, as in the *Columbidæ*, the ducts are quite bare of feathers.

In the centre of each nipple, which is generally encircled by feathers, is a round, smooth, single orifice, through which a probe can be readily introduced, and through which aperture the fluid contents of the glands, especially in the living birds, can easily be squeezed out. The two glands are closely united at their posterior part by dense fibrous tissue. The internal portion of the gland consists of elongated cylindrical glandules or tubules, as described by Prof. Owen, which supply the secretion. They pass generally from before backwards, taking an oblique longitudinal direction, and they terminate in rounded extremities, having, I think, a small central aperture; but of this I speak with some amount of hesitation. These tubules resemble somewhat the proventricular glandules. In some diseased glands the contents of the tubules are readily seen under a low power, and if immersed for some time in æther, and then dried, they are more distinctly visible. They all terminate in what may be called the cavity of the gland, a small space varying in size in different birds, and generally partly filled with the fatty or oleaginous secretion, but sometimes found quite empty. In some birds this portion of the gland is interlaced with a network of fibrous tissue, in which the secretion is partly lodged.

In young birds, as shown by the Thrushes on the table, the glands are small, semitransparent, gelatinous, and very vascular under a low power, and an abundant network of vessels is seen to ramify on the surface; the brush or tuft is indicated by a minute black speck, as are also the duct-orifices. I think I have found the glands larger and more perfect at birth in feathered birds, as in the Duck and Plover; but my observations are not sufficiently numerous to enable me to speak with certainty on this point.

Nature of the secretion.—It varies much in consistence, sometimes being thick and pap-like, and at other times clear like pure oil. It leaves a greasy stain upon blotting-paper, burns after a time with a brisk flame, dissolves readily in æther, and forms an oily, soapy compound with potash. Under the microscope it presents various

appearances, depending much upon the consistence of the matter; when solid, cholesterine plates are often seen in it; and when fluid, it has much the appearance of animal oil.

Relative size.—I have in numerous instances weighed the bird and the gland at the same time, but I will select only a few examples from the tables. The birds were in tolerable condition, and many of them in a wild state; the word *about* must be used to all, as I have not included grains in weighing large birds for this purpose. The relative proportion of the glands to the body was as follows in the subjoined list:—

Peregrine Falcon. *Falco peregrinus*	1-2886
Kestrel. *F. tinnunculus*	1-1980
Long-eared Owl. *Strix otus*	1-1840
Hooded Crow. *Corvus cornix*	1-788
Starling. *Sturnus vulgaris*	1-700
Water-Ousel. *Cinclus aquaticus*	1-560
Green Woodpecker. *Picus viridis*	1-1026
Grey Parrot. *Psittacus erythacus*	1-3420
Grey Partridge. *Perdix cinerea*	1-1401
Red-legged Partridge. *P. rufa*	1-1241
Common Pheasant. *Phasianus colchicus*	1-2100
Sand Grouse. *Pterocles arenarius*	1-3080
Wood Pigeon. *Columba palumbus*	1-6040
Domestic Pigeon. *C. livia*	1-4850
Bronze-winged Pigeon. *C. chalcoptera*	1-3066
Crested Pigeon (Australia). *Ocyphaps lophotes*	1-5504
Land Rail. *Gallinula crex*	1-876
Oyster-catcher. *Hæmatopus ostralegus*	1-2343
Ruff. *Tringa pugnax*	1-1960
Black-tailed Godwit. *Limosa lapponica*	1-2053
Whimbrel. *Numenius phæopus*	1-1750
Curlew. *N. arquata*	1-1608
Crested Crane. *Grus pavonina*	1-2112
Black Swan. *Cygnus atratus*	1-792
Tame Duck. *Anas boschas*	1-311
Muscovy Duck. *Cairina moschata*	1-296
Pin-tail Duck. *Anas acuta*	1-526
Shoveller. *A. clypeata*	1-438
Teal. *A. crecca*	1-555
Common Gull. *Larus canus*	1-364
Herring Gull. *L. fuscus*	1-563

Young Birds.

Coot. *Fulica atra* (half-grown)	1-245
Rook. *Corvus frugilegus*	1-2346
Thrush. *Turdus musicus* (a few days old)	1-1320

Use.—I scarcely need tell the members of the Society, that, even at the present time, much difference of opinion exists respecting the

use of these glands, probably the greater number of physiologists and ornithologists believing that the organs, as the name implies, are for the purpose of secreting an oleaginous fluid, with which the bird lubricates its feathers. Many, on the contrary, are of opinion that these glands do not serve for such a purpose, among the latter may be included many practical ornithologists; I need only mention the name of Mr. Waterton, and it was in consequence of reading the following extract from his 'Essays on Natural History,' 1844, p. 130, that my attention was specially directed to the subject; and during the last few years I have weighed these glands, and taken drawings of them in many birds, British and foreign, that I have dissected.

Mr. Waterton, among the reasons he gives for his belief that the glands in question are not used for the purpose of lubricating the feathers, says, in the work above referred to, "Again the oil-gland in most water-fowls is covered with a thick tuft of down, not moveable at pleasure; this tuft would prove an insurmountable obstacle to the transfer of matter from the gland through the medium of the bill. If for the purpose of lubricating the feathers, it would not have been granted by the Creator to one bird, and denied to another." Mr. Waterton goes on to mention a Kestrel struck down by lightning, in which the orifice of the gland was covered with a tuft of down, which had the exact appearance of a camel-hair brush, which would effectually impede the transfer of oil from the gland to the bill.

As I shall not have space to quote other authorities, I may as well answer Mr. Waterton at once. As regards the absence of the glands, I suspect it is of very rare occurrence. I have never failed to find them, except on one occasion in a young Ostrich, and here they may have escaped my notice. In others of the *Struthionidæ* that I have examined I omitted to look for them, my attention not having at that time been directed to the subject. If they are absent in any bird, a ready explanation, I believe, will be afforded by its peculiar habits or locality.

As for any *impediment* offered by the tuft of down to the egress of the oil, it is the most beautiful contrivance to effect this very object that can be imagined; as any one may determine by pressing these glands in any of our poultry, especially in the ducks, when the tuft spoken of becomes saturated with oil, and serves as a kind of sponge, from which the bird with its beak, sometimes with its head, can obtain the fluid. To speak in a plain manner, every bird carries not only a grease-pot in its tail, but most of them have also a brush in addition to this appendage.

But let any visitor to the Society's Gardens watch the Pelicans when they have had their bath; the birds, after soaking their feathers, dry themselves by flapping their wings; during this process the beak is frequently applied to the nipples of the glands, which, in this bird, are so large that they can readily be seen at some distance; the beak is then carried to various parts of the plumage, and the feathers are well-smoothed and oiled. The crown of the head, too, is often placed upon the nipples, and in this manner other parts are

lubricated to a greater extent. The same process may be witnessed in the Ducks and in many other birds. As I have stated before, the coccygeal muscles, I believe, greatly assist in propelling the oleaginous fluid from the ducts. The secretion, judging from the vascularity of the glands and from experiments I have made, is very abundant. During last summer, for the purpose of ascertaining the daily amount of secretion, I confined a duck and a hen in a coop, and for some time every day I squeezed the glands and expressed a large quantity of thick yellow oil, the operation apparently tending to increase the quantity of the secreted fluid.

I infer then that, looking especially to the structure of these glands, the character and quantity of their secretion, their relative size in the Palmipedes especially, they serve for the purpose usually assigned to them, viz. that of supplying an oily fluid for lubricating the skin and feathers.

I have not had time to speak of the morbid states of these glands; but those organs are not unfrequently enlarged in domesticated birds, and the character of the secretion sometimes is much altered. On the table are the tail-glands of the Common Goose, an old bird, in which it will be seen that the cavities are filled with a hard waxy material.

I hope at a future time to bring this matter before the Society, and to compare the structure of these glands with that of the anal glands of the *Viverridæ*.

May 22nd, 1860.

Dr. J. E. Gray, V.P., in the Chair.

Mr. Sclater exhibited a specimen of a new form of Dormouse (*Platacanthomys lasiurus*), lately described by Mr. Blyth* from the Malabar Coast, and presented to him by the describer.

The following papers were read:—

1. Notes on a Third Collection of Mammalia made by Mr. Fraser in the Republic of Ecuador. By Robert F. Tomes.

1. Arctibeus perspicillatus, Geoff. sp.

2. Arctibeus pusillus, Natt. sp.

Phyllostoma pusillum, Natt. Wagn. Weigm. Archiv. 1843, i. 366; Tschud. Faun. Peru. i. 63; Wagn. Supp. Schreb. v. p. 634. pl. 43.

Several specimens of this species appear in the collection, and were,

* Journ. As. Soc. Beng. vol. xxviii. p. 289.